DRAFT
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MEMORANDUM

SUBJECT: Implementation of Exposure Assessment Guidance for RCRA Hazardous Waste Combustion Facilities

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TO: Waste Management Division Directors, Regions I-X

This memorandum transmits guidance and recommendations on how to implement the Agency's guidance on conducting indirect exposure assessments in determining permit conditions for RCRA hazardous waste combustion facilities. The primary Agency documents on this subject are the 1990 ORD report "Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions" and the 1993 Draft Addendum to that report.

While the Agency's Draft Addendum to the Indirect Exposure Document describes the general procedures in conducting indirect exposure assessments and provides some level of detail on parameter assumptions and other specific factors, there are a number of additional issues which need to be dealt with in the context of specific programs. The attachment to this memorandum attempts to address those issues in the context of the RCRA program. The issues are discussed under the following categories:

Who Performs the Risk Assessment
Emissions Issues
Risk Characterization Issues
Risk Management Issues

It is important that this material be used in conjunction with the Draft Addendum and the Indirect Exposure Document, since its intention is to supplement those documents. For example, references to documents mentioned in this memorandum are generally provided in the Draft Addendum.

EPA will need more extensive analysis of the chemicals ...er in the emissions to estimate risks from both direct and ir exposures. The risk assessment called for in Draft St involves two significant expansions from what was typ conducted previously: (1) the number of routes of exposure v expanded and (2) the number of compounds analyzed and used risk assessment will be expanded in order to identify as l fraction of the emissions as is realistically possible.

Guidance on Development of Facility-Specific List

While the actual list of compounds the facility must and analyze is to be determined by the permit writer, the fol guidance is offered to assist the permit writer in develc site-specific list.

a. The first list the permit writer should consider requir: facility to sample and analyze is the 12 metals cur regulated under the BIF rule. (For boilers and indu furnaces, these metals must be addressed; for incinerat is strongly recommended they be addressed.) The secor the permit writer should consider requiring the facil sample and analyze are the compounds recommended in Tab: Attachment A (a.k.a. the "PIC list"). The permit writ also want to include some of the compounds on Tabl Attachment A. The compounds on Table 2 are curre ly evaluated and may be recommended at a future point in

b. Additionally, it is recommended that the permit write require the analysis of the 20 largest peaks obtained GC-MS analysis of the trial burn. This analysis will he determine whether there are any compounds that are not attached PIC list but that are present in high amount might significantly affect the risk.

c. The PIC list includes a full substituted dibenzo-p-dio: dibenzofuran analysis. It is recommended that the writer require the facility to perform this analysis i: to identify compounds with resolution that will ident: number of chlorine (or bromine or other halogens) mo: and whether the congener has a halogen on the : positions. The purpose for this resolution is to ca: Toxicity Equivalents (TEQs) which are used to calculat at the point of exposure. There are 7 pc 2,3,7,8-substituted dibenzo(p)dioxin congeners, rangir tetra-substituted to octa-substituted congeners, 10 possible 2,3,7,8-substituted dibenzofuran congener: ranging from tetra-substituted to octa-substituted conc

d. The PIC list also includes a full polychlorinated bi (PCB) scan. It is recommended that the permit writer r the facility to perform this analysis in order to .et the total PCB's. There are 209 possible PCB conc

ranging from mono-substituted congeners to deca-substituted congeners.

e. The permit writer should also require the facility to sample and analyze any additional highly toxic compounds that will be in the trial burn waste in high concentrations. The formulation of the wastes used in the trial burn is intended to provide a representative mixture of constituents that will generate PICs that are characteristic of emissions from the facility in permitted use [illegible] emissions can establish protective permit conditions. However, some of these compounds may survive the combustion process and be emitted intact. Hence, the list of principle feed constituents should also be added to the list of compounds for which the facility should sample and analyze. See Attachment B, "Guidance on Trial Burns," for a full discussion of factors to consider in the selection of waste constituents.

f. The permit writer may also require sampling and analysis of nitrogenated organic compounds. At this stage of development of the draft PIC list, not all of these compounds have been added. It is anticipated that EPA's stack sampling program will provide further guidance for nitrogenated PICs that the permit writer may require of the facility. Nitrogenated PICs are expected during the maximum temperature test.

g. The permit writer may also require sampling and analysis of any additional PICs that the permit writer believes are important.

Further guidance on the selection of compounds for analysis is provided in the trial burn guidance (Attachment B).

Development of the PIC List

The draft PIC list (i.e., Attachment A) was developed from existing data in EPA's possession as well as lists of toxic compounds from certain EPA programs. Since these lists were not developed to be lists of toxic PICs, compounds have been deleted from the lists that appear to be inappropriate. EPA recognizes the importance of using specific focused studies to develop a PIC list that is appropriately protective of the environment and not excessively burdensome on the regulated community. However, OSW considers it appropriate to use a draft list that is based on existing data for an interim period. As EPA collects additional PIC data, this list will be revised.

Source lists included:

* The hazardous waste constituent list in 40 CFR 261 Appendix VIII (Office of Solid Waste-OSW)
* The Hazardous Air Pollutants (HAP) list (Office of Air Quality Planning and Standards-OAQPS)

* Office of Research and Development list of o .n compounds found in combustion devices devel for the Draft Addendum to the Indirect E Document (includes PICs found in hazardou: combustion devices and other combustion dev

Inappropriate compounds were deleted from this list following basis:

- Compound was a pesticide that was unlikelv to be a
- Compound listed because it is a carcinogenic sugar substitute
- Listings that are not chemical specific such as "co:
- Compound for which EPA does not have a sampling and analysis method delineated
- Metallic compounds were deleted because of difficul: analyzing the specific compounds; metals are sti: included as elemental totals
- If the compound had a low octanol-water partition coefficient and did not have inhalation toxicity (i.e., it was not bioaccumulative and there was r direct inhalation toxicity data, thus it would nc affect the risk assessment)
- The compound had low toxicity values
- Naturally occurring plant toxins

Certain compounds were kept on the list such as:

- Pesticides that have a molecular structure that is s enough to be of concern as a PIC
- Compounds with very high octanol- water partition coefficients

Planned Further Development of List

EPA is undertaking experimental studies specifically di toward determining which toxic organic compounds are likely formed in trace quantities from hazardous waste combustion de The studies will explore variations in combustion conditio the effect on the specific organic molecules released. The s will also focus on defining operating parameters that can the type, character, and quantity of PIC emissions.

Accounting for Unidentified Compounds

One of the concerns that has been raised by the pub: that, even with the lists described in the previous sections, may be a significant number of unidentified compounds i emissions which will contribute to the overall risk fro facility. While the risks associated with heavy metal believed to be adequately addressed directly, given the r ımı level of compound identification, the risks from unıden

organic compounds could potentially be significant. Presented below are two approaches for addressing those potential risks. OSW recommends using the first option but solicits comment on the second approach.

The first option assumes that the unidentified organic compounds are similar in toxicity and chemical properties to those of the identified organic compounds taken as a whole, including compounds from the PIC list and any other voluntarily identified compounds that are toxic or that do not have toxicity data.

Under this assumption, the total risks from the organic compounds would be equal to the risks from the identified organic compounds multiplied by the ratio of the mass of total organic compounds to the mass of the identified organic compounds. This is accomplished computationally by increasing the emission rate of each of the identified organic compounds by the ratio of the concentration of total organic compounds to the concentration of all the identified organic compounds combined. Mathematically, this may be written as follows:

$$Q_{i,adj} = Q_i \cdot \frac{C_{TOC}}{\sum_i C_i}$$

where:

$Q_{i,adj}$ = *adjusted emission rate of compound i*
Q_i = *emission rate of compound i*
C_i = *stack concentration of compound i (carbon basis)*
C_{TOC} = *stack concentration of total organic carbon*

The risk assessment would then be conducted using the adjusted (i.e., increased) emission rates for each of the identified organic compounds. (Note: no adjustment is made to metals emissions.)

The second option would assume that all unidentified organic compounds are carcinogens and have a carcinogenic potency that is similar to the compounds on the PIC list. This option was developed to address the concern that any voluntarily identified compounds, beyond those on the PIC list, would tend to be primarily noncarcinogens or low potency carcinogens.

Under this assumption, the total carcinogenic ris. fi organic compounds would be increased by adjusting the emiss each of the organic carcinogens on the PIC list as follows

$$Qcp_{i,adj} = Qcp_i \cdot \frac{C_{TOC} - \sum_j Cn_j - \sum_k Ccn_k}{\sum_i Ccp_i}$$

where:

$Qcp_{i,adj}$ = *adjusted emission rate of PIC list carcinogenic compound i*

Qcp_i = *emission rate of PIC list carcinogenic compound i*

Ccp_i = *stack concentration of PIC list carcin compound i (carbon basis)*

Cn_j = *stack concentration of noncarcinogenic compound j (carbon basis)*

Ccn_k = *stack concentration of non-PIC list carcinogenic compound k (carbon basis)*

C_{TOC} = *stack concentration of total organic c*

The risk assessment would then proceed using the a (i.e., increased) emissions for the organic carcinogens list and the measured (i.e., unadjusted) emissions for tne carcinogens not on the PIC list and the organic noncarcino

The ratio for adjusting the emissions in the above eq should be based on the mass of carbon. This is becau analytical methods typically used for measuring total carbon are based on detection of the amount of carbon released from thermally oxidizing the sample. The results expressed on a carbon atom basis or some other basis (s propane). Therefore, the measured stack gas concentrations organic compounds that are identified in the analysis must converted to an equivalent carbon basis, as appropriate.

Total Organic Carbon Analysis

A total organic carbon (TOC) analysis is necessary to for the portion of the organic emissions that are not speci identified and quantitated. The permit writer should al applicant the latitude to determine the method to be u measure TOC. At present, EPA cannot recommend a specific Discussions with the Office of Research and Developme underway which are intended to lead to the developmen standard method. In the interim, the permit writer should the applicant to demonstrate that the method being used does and measure a variety of organic compound types, such as th of organic compounds found on the PIC list. The method ed

minimize any positive interference from the detection of carbon dioxide and carbon monoxide.

Quality Assurance

In order to encourage as complete an identification of the organic emissions as possible, the permit writer may require less stringent data quality objectives for the organic compounds which are not on the recommended PIC list.

For TOC,the permit writer may want to consider establishing specific quality assurance requirements on a case by case basis to ensure the reliability of the data.

Detection Limits

For compounds on the PIC list which are not detected, the permit writer should evaluate whether they are likely to pose a significant risk at concentrations near the detection limit. If this is the case, or if the detection limit achieved during the trial burn is significantly higher than can reasonably be achieved using sound sampling and analysis procedures, then these compounds should be included in the risk assessment at an assumed concentration of 1/2 the detection limit. Other compounds which are not detected need not be considered in the risk assessment.

GUIDANCE ON TRIAL BURNS

See Attachment B.

APPLICATION OF DATA

See Attachment B.

OTHER EMISSION SOURCES

The Draft Strategy is intended to address risks from combustion units burning hazardous wastes. Therefore, the analysis should ideally address air emissions from all sources that are an integral part of the combustion operation, including activities such as storage, blending, and handling of wastes fed to the combustion unit itself, as well as storage and handling of combustion residues (e.g., flyash, bottom ash, and quench water) generated by the combustion facility. For those facilities where these other activities are likely to contribute significant emissions and for which enough information is available to analyze their impact, the following approach is recommended.

"Fugitive" emissions generated from these on-site sources include volatile organics from RCRA-permitted tanks, containers, and related equipment (e.g., pumps, valves, and flanges) used in the storage and handling of liquid hazardous waste and pumpable solids, as well as fugitive dust from storage and handling of

combustible solids and combustion residues in open t containers, waste piles, conveyers, and trucks. Fugitive emis of volatile organics from equipment leaks (pumps, seals, fitt etc.) can be estimated on the basis of "Protocol for Equipment Emission Estimates", Document No. EPA-453/R-93/026. Fug emissions of volatile organics from storage tanks and conta can be estimated using the methodology provided in "Hazardous TSDF: Background Information for Proposed RCRA Air Emi Standards". Document No. EPA-450/3-89-023. These methods have adapted for spreadsheet calculations in the PC-based CHEMDAT7, which is available from the OAQPS Technology Tra Network (TTN) electronic bulletin board. Fugitive dust emis from open waste piles and staging areas can be estimated usir methodologies described in "Hazardous Waste TSDF - Fug Particulate Matter Air Emissions Guidance Document", Doc No. EPA-450/3-89-019. Many of the calculations have computerized, as described in "User's Manual for the PM-10 Fugitive Dust Source Computer Model Package", Document EPA-450/3-90-010, and are available from the OAQPS TTN bul board. Estimation of fugitive emissions using these me requires that estimates be made or measurements be taken c concentration of chemical constituents (e.g., volatile orga semivolatile organics, and metals) in the wastes being used as materials and in the combustion ash residuals.

Emissions from non-RCRA combustion units at a (e.g., power plants, etc.) and from other RCRA facilities i geographic area would not be directly included in the analys would instead be considered as part of the background level

3. RISK CHARACTERIZATION ISSUES

Historically, human health risk assessments in the program have focussed on high end individual risk or on bot estimates, such as the hypothetical "most exposed indiv (MEI). In the context of permitting hazardous waste combu facilities pursuant to the EPA's draft strategy, it is recom that risk assessors place primary emphasis on characterizir high end of the range of individual risks. This is because anticipated that high end individual risk will weigh heavi risk management decisions related to permitting.

SCREENING ESTIMATES

As a first step, screening estimates may be use demonstrate that risk from a particular combustion facili below a level of concern and that no further risk asse analysis is needed. Detailed guidance for conducting scr analyses is provided in Attachment C.

The attached guidance, which was developed jointly O OERR, is meant to serve as a "work book" for permit write

remaining parameters (other than media concentrations) to reasonable maximum estimates of exposure.

Constituents

For indirect exposures, the screening guidance focuses subset of constituents which have been judged to be of the gr concern by routes of exposure other than direct inhalation A multiple-pathway evaluation which emphasized food chain exp was conducted for 105 compounds on the PIC list. Factors tha considered in choosing an appropriate subset to address indirect exposure screening guidance included the importa indirect exposure pathways (relative to the direct inha pathway) and the relative toxicity of the compound. currently evaluating the remaining compounds on the PIC l determine whether additional compounds should be included screening guidance.

The subset of constituents that was selected for inclus the guidance for assessing indirect exposures is made dioxin-like compounds (PCDD's and PCDF's), polycyclic ar hydrocarbons (PAH's), polychlorinated biphenyls (PCB's) metals.[1] Also included are selected chlorophenols, chlor benzenes, nitroaromatics, and phthalates. These compounc among those that are most frequently detected during stack t of combustion devices.

Other constituents identified in the stack emissions th present at levels of concern through indirect exposure should also be included in the screening analysis. As indi OSW is evaluating additional compounds for possible inclus the screening guidance. For compounds which are identif stack gases but are not now addressed in the screening gui the Regions may want to contact OSW for assistance in eval these compounds and/or obtaining the relevant physical and ch properties data. Also, as the PIC identification guidanc discussed in Section 2, Emission Issues) begins to be implem the Regions are encouraged to inform OSW of the magnitud frequency at which the various compounds are being found in gases. Such information will enable OSW to evaluate with g confidence what additional constituents may need to be addres future revisions to the guidance.

For direct exposures, the screening analysis should i all constituents for which data are available (i.e., da emissions and information on toxicologic criteria or benchm

[1] The April 15, 1994 draft screening guidance, which includes four (arsenic, beryllium, lead, and mercury), will be revised to in de additional metals which are on the PIC list (antimony, barium, cadmium, ch nickel, selenium, silver, and thallium).

Given the diverse mixture of constituents to which individuals may be exposed from combustion sources, a screening analysis should consider additivity of both constituents and pathways, as discussed below in the sections "COMBINING CONSTITUENTS" and "COMBINING PATHWAYS" and in the screening guidance. It is important to include the significant constituents and pathways in the screening analysis in order to retain the conservatism necessary for developing appropriate screening estimates.

Although it is anticipated that site-specific land use data will not generally be needed to develop screening [illegible] the screening guidance does recommend that some site-specific data be used. This is the case for much of the input data required for the air dispersion and deposition model (currently recommended as COMPDEP), due to the complex interactions among stack related parameters, terrain, and meteorological conditions. Here data availability should not be an issue: values for stack parameters should be available for any facility seeking a RCRA permit; actual terrain data are readily available for virtually all locations; and hourly meteorological data are available for numerous sites around the country. The use of actual terrain and meteorological data is regarded as standard practice for the application of air dispersion models for most air pathway analyses involving the use of long-term (e.g., annual) average ambient air concentrations. Although the effort required to process these data is not trivial, standard procedures and software are available for doing so and are widely used. Sources from which these data may be obtained are identified in the screening guidance.

The screening guidance also recommends that certain site-specific data be used for surface water pathways, in particular the size and location of the watershed or waterbody and, for rivers and streams, the average annual flow. Such data are readily available and should be used; in certain instances, however, conservative default values are provided if needed.

Fugitive Emissions and Upsets

Fugitive emissions and upset emissions should be included in the screening analysis. Although upsets are not generally expected to increase stack emissions by more than a factor of two over the life of the facility, upset emissions should be estimated for the particular facility based on the operating history of the facility or similar facilities. Fugitive emissions should be estimated based on the types of wastes the facility will be burning. (See the discussion of "Other Emission Sources" under Section 2, "Emissions Issues")

Since fugitive emissions have characteristics that are different from those of stack emissions, dispersion of fugitive emissions should be modeled separately, with the plume impacts being added at the receptor point. A number of dispersion models

can be used for this purpose, including the FDM and ISC2 models, models which are available on the OAQPS TTN bulletin board.

Ecological Effects

Given the EPA's commitment to the protection of ecosystems, it is also expected that as part of the screening analysis an evaluation should be conducted of the potential for ecological impacts to the extent feasible. (Although this issue arises in both screening and detailed or site-specific assessments, it is discussed here.) The ecological assessment should include identifying critical ecological resources to be protected from reduction, degradation, or loss in quantity, quality or use, including critical fish and wildlife habitat and the presence of endangered species. Also, the ecological assessment should include an evaluation of whether the impacts of the combustion facility on ambient surface water concentrations of toxic constituents are likely to cause exceedances of State water quality standards.

HIGH END INDIVIDUAL EXPOSURE

If the screening analysis indicates that a more detailed, site-specific risk assessment is needed, it should include a description of the high end of the distribution of individual exposure(s).[2] High end exposure(s) are plausible estimates of individual exposure(s) for those persons at the upper end of the distribution. The intent of this descriptor is to convey estimates of exposure in the upper range of the distribution, but to avoid estimates which are beyond or above the true distribution. Conceptually, high end exposure(s) means exposure(s) above the 90th percentile of the population distribution, but not higher than the individual in the population who has the highest exposure.

The Draft Addendum describes an approach for estimating the distribution of exposures across the population in the study area through a combination of concentration isopleths and information on activity patterns (location of farms, residential areas, etc.). This approach provides exposure estimates for population subgroups (farmers, school children, etc.) within each of the isopleths, and these estimates can be combined to yield a general population distribution. The high end individual exposure can then be determined by selecting within the most exposed 10 percent of the distribution.

This approach will require that a substantial amount of information be collected on locations and activity patterns for the whole population of concern in the study area. An alternative approach would be to identify those populations in areas with relatively high concentrations and high risk activity patterns and define these as the high end of the distribution. This alternative

[2] "Guidance for Risk Assessment", Risk Assessment Council, November 1991.

may require some iterative analysis, particularly since high risk activity patterns can vary depending on the constituent. However, this approach could require collection of substantially less information.

Once a population of concern has been identified, one can either set all exposure parameters such as consumption rates to central tendency values (if this population is relatively small) or else high end exposures within that population can be estimated by identifying the most sensitive parameters that determine the [illegible] and setting the values of one or a few of these to their high end values while leaving all other parameters at their "typical" values.[3] However, combinations of parameter values that are highly unlikely to occur at the same time should be excluded. Generally speaking, parameters that are known to be highly correlated should be varied together. Whether the upper end or the lower end of the distribution of the parameter is used depends on whether the parameter has a directly proportional or inversely proportional relationship to risk. Sensitivity analysis should be performed to support the selection of the most sensitive parameters for the various constituents and pathways.

In setting the values of the most sensitive parameters for use in estimating the high end exposure, it is recommended that values at or above the 90th percentile be used (or, conversely, at or below the 10th percentile). If only a relatively few data points are available, the maximum or near-maximum value should be used (or, conversely, the minimum or near-minimum value).

COMBINING CONSTITUENTS

Generally speaking, the risks to an individual exposed to a mixture of carcinogens should be combined by adding the constituent-specific risks, unless synergistic or antagonistic interactions are known to occur for the specific mixture.[4] However, for systemic toxicants, estimating a hazard index for a mixture is generally appropriate only if the constituents induce the same effect by similar modes of action.[5] Because different effects occur for the same chemical at different dosages, and because biochemical mechanisms are infrequently known or understood, it is suggested that hazard indices for mixtures be estimated only if, at a minimum, the RfDs of the individual

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[3] Ibid.

[4] "The Risk Assessment Guidelines of 1986", Office of Health and Environmental Assessment, August 1987.

[5] Ibid.

components are all based on effects in the same target organ.[6] It should be noted that, since many carcinogens also exhibit systemic effects, carcinogens should be included for consideration when non-cancer, individual risks from chemical mixtures are being evaluated.[7]

COMBINING PATHWAYS

When estimating individual daily doses, exposures from different pathways should be added for each route of exposure (i.e., oral, dermal, or inhalation) if there is a reasonable expectation that the same individuals are exposed.

For carcinogens, exposures can be added across direct and indirect pathways if the constituent is a carcinogen through both oral and inhalation routes. For non-carcinogens, it is appropriate to add oral and inhalation exposures only if there is information to indicate that the oral reference dose and the inhalation reference concentration are based on the same effect. Generally, dermal exposures can be combined with oral exposures.

When combining exposures, it is important to consider whether the same individual is likely to be exposed through each of the exposure pathways that are being added.

EXPOSURE DURATION

The duration of exposure should take into account both the expected operational life of the facility and the time period of residence that is discussed in the guidance. For many exposure pathways, exposures may continue after the facility has ceased operations, due to continued cycling of contamination in and between biota, soils, and sediments. Generally speaking, exposure durations should represent less-than-lifetime exposures, unless it is reasonable to expect that individuals will be exposed for a lifetime. Estimates of the likely duration of exposure via a given exposure pathway should be made wherever possible. Local census data and, for unusual situations, limited site-specific surveys can help establish the likely durations of individual exposures.

4. RISK MANAGEMENT ISSUES

LAND USE

The risk assessment should consider both current land use and ways in which the land surrounding a combustion unit are reasonably

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[6] "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)", Office of Emergency and Remedial Response, December 1989.

[7] Ibid.

likely to be used so that the appropriate exposure pathways, potentially exposed populations, exposure parameters, and equations can be used to estimate acceptable emission limitations. To determine reasonably expected land uses, risk assessors should rely on a combination of available information and best professional judgment. Several factors to be considered for determining reasonably expected land use include: projected land use based on recent trends, changes in population growth and population density near the combustion unit, and restricted land uses because of local zoning laws.

ACCEPTABLE TARGET LEVEL

To ensure protection of human health from emissions of toxic constituents, the total incremental risk from the high-end individual exposure to carcinogenic constituents should not exceed 10^{-5}. For systemic toxicants, the hazard quotient (e.g., the ratio of the total daily oral intake to the reference dose) for the constituent or, when appropriate, the mixture should be less than 0.25.[8] In the case of lead, for which there is no reference dose, direct comparison with media-specific health based levels is suggested, after adjusting for background levels; specifically, values of 100 mg/kg for soils and 0.2 $\mu g/m^3$ for air are recommended. (Note: See the discussions on "COMBINING CONSTITUENTS" and "COMBINING PATHWAYS" for more specific guidance.)

The selection of these levels (as opposed to, for example, an incremental cancer risk level of 10^{-4} and a hazard quotient of 1.0) was done in part to account for exposure to background levels of contamination (including indirect exposures from other combustion units) which should be considered as part of the risk estimation and decision-making process to set emission levels at a combustion unit. The unit will not likely be the only source contributing to exposures in the study area and to neglect other environmental sources may overestimate an allowable emission level, leading to unacceptable total risk to the public. In this case, background is defined as those exposures in drinking water, food, and air attributable to sources other than the combustion unit(s) being assessed.

If detailed information on background sources is available for a particular area, the permit writer may choose to use this information to develop an alternative approach for incorporating background levels.

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[8] This approach is consistent with the approach taken in the Boiler and Industrial Furnace Rule, 56 FR 7169 (February 21, 1991). However, the way in which cancer risk is estimated in this guidance differs from the BIF rule to more closely follow Agency guidance. For example, in the BIF rule carcinogenic metals and organic compounds are not aggregated, Group A and B carcinogens are not aggregated with Group C carcinogens, and a hypothetical MEI is estimated.

NOTE: The results of any risk assessment which is conducted pursuant to this guidance do not replace the requirements of the BIF rules at 40 CFR Part 266 Subpart H. Therefore, allowable levels of metals emissions that are derived from a risk assessment conducted pursuant to this guidance should be compared to those determined under the BIF rule and the more stringent levels should be used to establish the permit limits. However, for incinerators, allowable levels that are derived from a risk assessment conducted pursuant to this guidance should be used to establish the permit limits, as applied under Omnibus authority.